I. Life Science
the study of living things
A. It all starts with a question
How? Why? When? Etc.
B. Diversity of life
1. What is diversity
2. There are diverse habitats for animals
areas where animals live and are suited to live in that host a diversity of organism species.

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D. Some life scientists perform research on diseases such as cystic fibrosis, a genetically inherited disease
1. How do people inherit diseases?
2. Protecting the environment

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a. Many environmental problems are caused by people's misuse of natural resources
→ understanding the world and how humans affect the world is the first step in finding solutions to environmental problems

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C Life Scientists
1. Anyone - from professional to you. You just have to ask questions about life.
2. Anywhere - in a lab or field
3. Anything - curiosity

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1.2 Scientific Methods

I. Scientific observations can lead to questions or an identifiable problem

A. Scientific Methods – the ways in which Scientists follow steps to answer questions and solve problems

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B. Observations - the information you gather in trying to solve a problem or answer a question
→ using your senses to gain info

C. Hypothesis- is a possible explanation or answer to a question based on prior Scientific research and can be tested

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1. Predictions - before scientists can test a hypothesis, they must first make predictions, a statement of cause and effect that can be used to set up a test for a hypothesis

D. Testing the hypothesis- Scientists test hypotheses in order to show if a particular factor influenced the experiment outcome

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1. A factor is anything in an experiment that can influence the experiment's outcome (i.e. temperature)

2. How do we control experiments?

a. Controlled experiments- test only one factor at a time and consists of a control group and one or more experimental groups

b. all factors for the control group and the experimental group are the same except one

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c. The one factor that differs is the variable

3. Designing an experiment- requires good planning
   a. every factor needs to be considered
4. Collecting data- the more data you have, the more information you have to support your findings

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a. when an experiment consistently produces the same results consistently, scientists can be more certain about the effect the variable has on the outcome of the experiment

E. Analyze the Results
   → scientists must organize their scientific findings (data) in order to make sense of (analyze) their findings

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1. Analyzing results help scientists explain and focus on the effect of the variable

F. Draw Conclusions
   1. After analyzing the data, scientists must draw conclusions based on their experimental findings
   2. How can a wrong hypothesis be helpful?
      → class discussion

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G. Communicate Results
   1. Scientists communicate their results for a few reasons
      a. other scientists may then repeat the experiment to see if they get the same results
      b. the information can be considered by other scientists w/similar interests

★ Remember there are many paths from observations to communicating results, but true scientific research utilizes the scientific method

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Section 1.1 review

Grade: 7th
Subject: Life science
Date:

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1 Diversity is the variety of life

True
False

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2 One way life scientists help protect the environment if by...

A cutting down trees
B studying human impacts on the environment
C promoting pollution

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Section 1.2 review

Grade: 7th
Subject: Life science
Date:

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1 Information you gather in trying to solve a problem is called a hypothesis

True
False

Aug 23-7:03 PM

2 The ways in which scientists follow steps to answer questions and solve problems is called...

A Sceintific reason
B Scientific method
C Critical analysis

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3 Anything in an experiment that can influence the experiment's outcome is called...

A a control
B a factor
C a dependent variable

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4 How many factors should an experiment test?

A 1
B 2
C 0

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5 A wrong hypothesis can be helpful because it gives a scientist information

True
False

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1.3 Scientific Models

A. A scientific model is a representation of an object or a system
(3 types of scientific models)

→ models are used to help explain how something works or to describe how something is structured

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1. Physical Model - models that look and/or act like the thing they represent (i.e. human skeleton)
2. Mathematical Model - models that can be made up of numbers, equations, or other forms of data
3. Conceptual Models - can either represent systems of ideas or compare unfamiliar things w/ familiar things

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B. Benefits of Models - models can be used to represent very small or large things, they can also represent things that don't exist anymore (dinosaurs)
   1. A model can be a kind of hypothesis and can be tested

C. Building Scientific Knowledge
   → scientists may draw different conclusions from the same data

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1. Scientific Theories - an explanation that ties together many related facts, observations and tested hypotheses
   a. theories are conceptual models that help organize scientific thinking
2. Scientific Laws - a scientific principle that rarely changes. No exceptions have been found

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   a. laws are a summary of many experimental results and observations
   b. laws tells us what happens, not why
3. Combining Scientific Ideas
   a. scientific laws are at work around you everyday (Newton's law of gravity)
   b. theories can not be proven completely, but can be widely accepted, like the theory that all living things are made of cells

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4. Scientific Change
   a. History shows that new scientific ideas take time to develop into theories or to become accepted facts or laws

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1.4. Tools, Measurement, and Safety

I. Computer and Technologies
   1. by using technology, life scientists are able to find info and solve problems in new ways

II Tools for seeing

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→ it is difficult to make accurate observations of things that cannot be seen

A. Microscopes and Telescopes revolutionized how scientists could make observations
   1. Compound Light Microscope - an instrument that magnifies small objects so that they can be seen easily
      a. three main parts: a tube with two or more lenses, a stage, and a light

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2. Electron Microscopes - tiny particles called electrons are used to produce magnified images
   a. two kinds: TEM - transmission electron microscope
      SEM - scanning electron microscope

III. Measurement
→ the ability to make reliable measurements is an important skill in science
→ However, different standards of measurement exist throughout the world

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A. The International System of Units (SI)
1. SI units are an international system for performing measurements
a. helps scientists from different parts of the world share their results and observations
B. Area- a measure of the size of a surface or a region
C. Volume- a measure of the size of a body or region in a (3-D) three-dimensional space

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D. Mass- is a measure of the amount of matter in an object
E. Temperature- a measure of how hot or cold something is

IV Safety Rules

A. Review Lab handout
B. Figure 5 Safety Symbols in book

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Section 1.3 review

Grade: 7th
Subject: life
Date: science

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1 A scientific model is a representation of an object or a system

True
False

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2 Which are types of scientific models, choose all that apply

A mechanical models
B physical models
C mathematical models
D closed models
E conceptual models

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3 Scientific laws are scientific principles that change often

True
False

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Section 1.4 review

Grade: 7th
Subject: life
Date: science

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1 Which produces a 3-D image

A transmission electron telescope
B scanning electron telescope
C compound light telescope

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2 What is the correct SI unit for length?

A meter
B feet
C yard

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3 What is the correct SI unit for volume?

A cubic meter
B gallons
C ounces

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4 What is the correct SI unit for temperature?

A kelvin
B celcius
C fahrenheit

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